

**Composite, multilayer copolymer used as impact modifier - has internal elastomeric unit contg. conjugated diene and/or alkyl acrylate etc. and outer non-elastomeric unit of alkyl methacrylate, etc.**

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### Patent Family

Patent Number	Kind	Date	Application Number	Kind	Date	Week	Type
EP 279724	A	19880824	EP 88400190	A	19880128	198834	B
FR 2610328	A	19880805	FR 871169	A	19870130	198838	
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**Cited Patents:** A3...8836; No search report pub.; US 4086300; US 4145380; US 4419492

### Patent Details

Patent	Kind	Language	Page	Main IPC	Filing Notes
EP 279724	A	F	10		
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US 4897449	A		7		
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DE 3880528	G			C08F-285/00	Based on patent EP 279724
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### Abstract:

EP 279724 A

A composite, multi-layer copolymer comprises (I) an internal, elastomeric unit, with Tg not above 25

deg.C, polymerised from a mixt. contg. w.r.t. 100 pts. wt. (a) 50-99.9 pts. of a conjugated diene and/or an alkyl or aralkyl acrylate, (b) 0-49.9 pts. of a monoethylenically unsatd. monomer, (c) 0.05-8 pts. of a cross-linking monomer, and (d) 0.05-6 pts. of a grafting monomer and (II) and outer, non-elastomeric, relatively hard, unit with Tg above 25 deg.C, polymerised in presence of unit (I), from a mixt. contg. w.r.t. 100 pts. wt., (a) 50-99.9 pts. of a 1-4C alkyl methacrylate, a vinylaromatic hydrocarbon and/or an unsatd. nitrile, (b) 0.1-50 pts. of a monoethylenically unsatd. monomer, and (c) 0-5 pts. of a chain-limiting agent. The copolymer consists of a mixt. of (1) particles of dia. 40-150 nm, and (2) particles of dia. 160-500 nm, in ratio by wt. of (1):(2) of 5:95-95:5.

USE - A compsn. contg. (i) 10-99 pts. wt. of a rigid thermoplastic polymer from a 1-4C methacrylate, a vinylaromatic hydrocarbon, or a polymer contg. more than 50% of 1 of these monomers, and (ii) 90-1 pts. of the multi-layer copolymer is claimed.

ADVANTAGE - Shock (esp. notched Izod) resistance of the compsn. is improved, without affecting the transparency.

Dwg.0/0

EP 279724 B

Multilayer composite interpolymer comprising at least: an elastomeric internal stage which in itself has a glass transition temperature lower than or equal to 25 deg. C, polymerised by starting with a mixture comprising, per 100 parts by weight: (a) from 50 to 99.9 parts by weight of at least one main monomer chosen from conjugated dienes and alkyl or aralkyl acrylates; (b) from 0 to 49.9 parts by weight of at least one other monomer containing monoethylenic saturation copolymerisable with the said main monomer; (c) from 0.05 to 8 parts by weight of at least one crosslinking monomer; and (d) from 0.05 to 6 parts by weight of at least one grafting monomer; and a relatively hard, nonelastomeric external stage which in itself has a glass transition temperature higher than 25 deg.C polymerised in the presence of the product of the preceding stage, by starting with a mixture comprising, per 100 parts by weight; (a) from 50 to 99.9 parts by weight of at least one main monomer chosen from alkyl methacrylates in which the alkyl group contains from 1 to 4 carbon atoms, vinylaromatic hydrocarbons and unsaturated nitriles; (b) from 0.1 to 50 parts by weight of at least one monomer containing monoethylenic unsaturation copolymerisable with the said main monomer, and (c) from 0 to 5 parts by weight of at least one chain limiter agent, characterised in that it has a bimodal particle distribution and that it consists of a mixture; (1) of a population of particle whose mean diameter is between approximately 40 and 150 nm; and (2) a population of particles whose mean diameter is between approximately 160 and 500 nm, in a weight ratio of the population (1) to the population (2) of between approximately 5/95 and approximately 95/5.

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US 4897449 A

Multilayer composite interpolymer comprises: elastomeric inner phase with glass transition temp. at most 25 deg.C polymerised from mixt. contg., per 100 parts wt. (a) 50-99.9 of alkyl or aralkyl acrylate monomer; (b) 0-49.9 of at least one other monoethylenically unsatd. monomer; (c) 0.05-8 of crosslinking monomer and (d) 0.05-6 of at least one grafting monomer, and hard, nonelastic outer phase with glass transition temp. above 25 deg.C polymerised in presence of inner phase from (a) 50-99.9 of at least one 1-4C alkyl methacrylate monomer, (b) 0.1-50 of at least one monoethylenically unsatd. monomer, (c) 0-5 of at least one chain limiting agent. The prod. has particle population of mean dia. (1) 40-150nm and (2) 160-340nm. Wt. ratio of (1):(2) is 10:90-90:10. USE/ADVANTAGE - By reinforcing

rigid thermoplastic polymer matrices with the interlayer a greater impact strength results. (7pp)

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